INTEGRATED TRAINING AREA MANAGEMENT

ITAM Learning Module

Tactical Units & Equipment

Lesson Two: Combat Equipment and Vehicles

Objectives

To achieve a successful ITAM program, land managers must understand the primary tactical missions and training requirements of the units that use their installation and training/testing lands. This Lesson is the second lesson of a five-part learning module, which will help students to learn more about the Army, its organization, and missions.

By completing this Lesson, students will:

1. Identify the individual equipment used by soldiers.
2. Identify the major combat vehicles used by Army units.
3. Identify the major helicopters used by Army units.
4. Identify the major support vehicles used by Army units.

Field Gear

Every soldier in the United States Army is issued uniforms and clothing upon initial training. Additionally each soldier is issued (on a loan basis) a set of personal equipment to use during field exercises or combat.

Most of this equipment is survival or protective in nature. This equipment is commonly known as "field gear" or "TA-50." The major items within a complete set of TA-50 are a helmet, armored "flak" vest, belts, weight bearing suspenders, pouches, canteens, wet (and cold) weather gear, tent-making items, a sleeping bag, and other equipment.

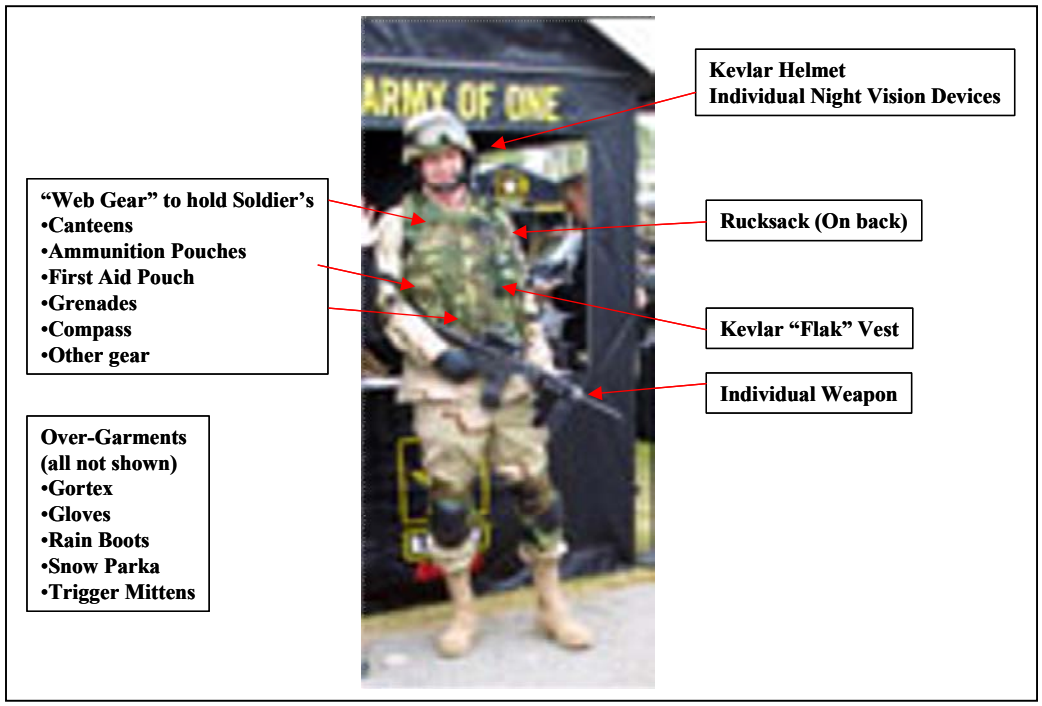
Other more specialized soldiers (such as aviation or armor soldiers) are issued additional gear such as NOMEX fire-resistant coveralls, gloves, and special helmets. Most soldiers will also be responsible for maintaining expensive night vision devices, global positioning units, or radio gear in addition to their personally assigned weapon

Below, is a list of basic TA-50 normally issued to soldiers. The soldier is accountable for its maintenance and serviceability to ensure he can train properly.

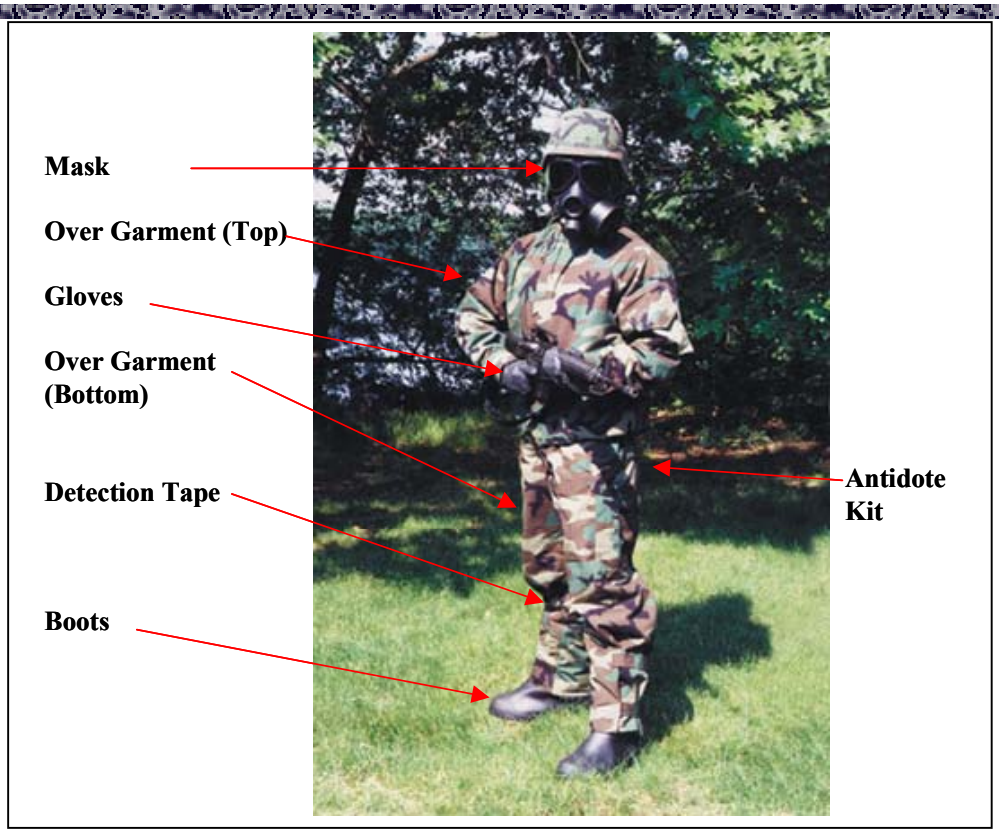
TA-50 Inventory Checklist as of 15 May 2003

1. Adapter, Blank Firing (M16a1/A2)
2. Authorized Awards And Decorations
3. Bag, Barracks
4. Bag, Duffel
5. Bag, Waterproof
6. Band, Helmet, Camouflage Cover
7. Belt, Individual Equipment
8. Belt, Trousers Black
9. Blanket, Wool
10. Boots Black Leather
11. Buckle, Belt, Black Open-Face
12. Canteen, Water
13. Beret, Black
14. Cap, Cold Weather
15. Carrier, Entrenching Tool
16. Case, Field First Aid W/ Dressing
17. Case, Small Arms Ammunition
18. Coat, Black, All Weather
19. Coat, Cold Weather Camouflage
20. Cover, Helmet Camouflage
21. Cover, Canteen Water
22. Cup, Canteen
23. Distinctive Unit Insignia
24. Drawers, Cold Weather
25. Ear Plugs, W/ Case
26. Entrenching Tool, Combination
27. Flashlight, Batteries (Red Filter)
28. Gloves, Leather Black Dress
29. Helmet, Kevlar
30. Inserts, Glove, Wool
31. Glove Insert Cold Weather, or Inserts, Mitten Wool
32. Insignia, U.S.
33. Insignia Branch Of Service
34. Insignia Grade Pin-On Brass As Required
35. Kit, Cleaning M16
36. Kit, Personal Hygiene
37. Liner, Coat, Cold Weather
38. Lock, Key Or Combination
39. Mask, Chemical Protective
40. Mattress, Pneumatic Or Pad
41. Magazine, M16A1/A2
42. Glove Shells, Cold Weather or Mitten, Shells

43. Chemical Protective Clothing - Mission Oriented Protective Posture (MOPP) Suit With All Accessories
44. Nameplate, Plastic
45. Overshoes, Rubber
46. Parka, Trouser Wet Weather
47. Gortex Top And Bottom or Complete Parka Cold Weather and Liner
48. Personal Hygiene Articles
49. Poncho Protractor
50. Rucksack
51. Scarf, Wool or Gator Neck
52. Shirt, Camouflage
53. Battle Dress Uniform
54. Shirt, Long Sleeve
55. Shirt, Short Sleeve
56. Shoes, Athletic
57. Shoes, Shower
58. Sleeping Bag
59. Socks, Wool
60. Socks, Athletic (White) Crew Length
61. Suspenders, Individual Equipment Belt
62. Tag, Identification W/Chain and Values Tag
63. Towel, Bath
64. Trousers, Camouflage Battle Dress Uniform
65. Undershirt, Cold Weather
66. Undershirt, Cotton
67. Personal Fitness Uniform (PFU) Sweatshirt
68. PFU Sweatpants
69. PFU Trunks
70. PFU T-shirt
71. Physical Training (PT) Cap
72. Washcloth
73. Eye Glasses and Inserts, Military issue (if applicable)
74. Compass, Lensatic

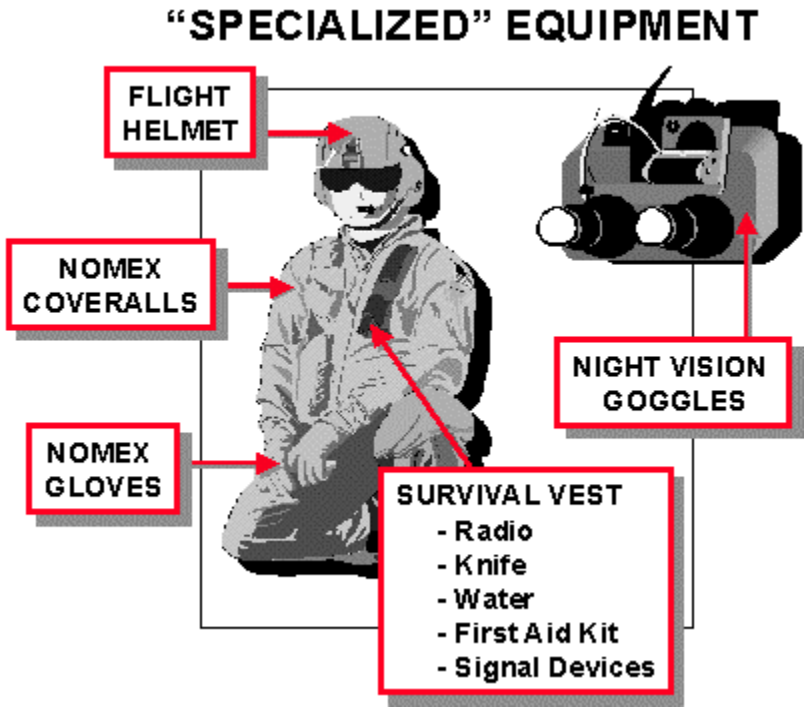


Nuclear, Biological, and Chemical (NBC) Gear and Specialized Equipment



In addition to TA-50, soldiers are equipped with specialty gear designed to protect him/her from Nuclear, Biological, or Chemical weapon effects.

All soldiers will have NBC gear, i.e., a protective mask with hood to cover the Kevlar helmet, protective over garments, and rubber over-boots and gloves. NBC gear also includes detection tape to sense the presence of NBC agents on the battlefield, and antidote kit to use in the event of unprotected exposure to these agents.



Weapons Systems

The Army cannot perform its wartime missions without weapons.

There are two very broad categories of weapon systems -- individual and crew-served. Individual weapons are items that take only one person to successfully operate (such as a rifle or hand grenade). Crew-served weapons are larger and must have two or more soldiers (a "crew") to successfully operate them. A machine gun, tank, and helicopter are considered crew-served weapon systems.

Individual Weapons

Individual weapons have two sub-categories: firearms and grenades.

Firearms are conventional bullet-firing rifles or pistols. The primary firearm in the inventory is the 5.56mm/.223 caliber M-16 rifle, which is issued to most soldiers with all types of units. Other weapons are the 9mm M-9 "Beretta" pistol, the M-4 Carbine (5.56mm/.223 caliber) a lightweight version of the M-16 (not shown), and a lightweight automatic rifle called the M-249 Squad Automatic Weapon (or SAW, also 5.56mm).

M-9

The M-9 is a 9mm double-action semiautomatic pistol, with a 15-shot magazine.

M-16

The M-16A2 is a lightweight 5.56mm (approximately .22 caliber) rifle with a 30-shot magazine. The weapon was designed for either automatic (three-round bursts) or semiautomatic (single shot) fire. The bottom of the trigger guard opens to provide access to the trigger when the shooter is wearing gloves or mittens. A compensator helps keep the muzzle down during firing.

M-249 Squad Automatic Weapon (SAW)

The M-249 Squad Automatic Weapon (SAW) is a lightweight 5.56mm machine gun carried by infantry squads. The SAW is a magazine or belted automatic rifle. It can be carried and operated by an individual soldier. It provides infantry squads and fire teams with the ability to fire at targets at greater distances than with a rifle and for longer periods without stopping. Gunners have the option of using a 30-round magazine or a 200-round magazine

Hand grenades are either explosive or non-explosive. Explosive grenades are designed to kill enemy personnel through blast or fragmentation. Non-explosive grenades can incapacitate, obscure, or signal with smoke, flash-bang, or CS ("teargas"). All are thrown baseball-style by an individual.

One hybrid weapon used is the 40mm M-203 grenade launcher. It fits under an M-16 rifle and shoots an oversized, shotgun-like grenade. M-203 grenades have the same effects as regular hand grenades.

M-203 (40 mm) Grenade Launcher

The M-203 40mm Grenade Launcher is used while attached to a M-16A2 5.56mm rifle. It is a lightweight, compact, and breech-loading, pump action, single shot launcher. The launcher consists of a hand guard and sight assembly with an adjustable metallic folding, short-range blade sight assembly, and an aluminum receiver assembly which houses the barrel latch, barrel stop and firing mechanism. The launcher is capable of firing a variety of low-velocity 40mm ammunition. The launcher also has a quadrant sight that may be attached to the M-16A2 carrying handle and is used for maximum effective range.

Crew-Served Weapons

Crew-served weapons fall into five main sub-categories:

1. Machine Guns
2. Armored Combat Vehicles
3. Indirect Fire Weapons
4. Air Defense Weapons
5. Rotary Wing Aircraft (Helicopters)

Machine Guns

Machine guns comprise the first series of crew-served weapons. They are usually much larger, fire bullets faster, and have larger bullets than rifles (some capable of penetrating steel and concrete).

A machine gun will have a crew of two or three (a gunner, an assistant gunner, and possibly an ammunition bearer). Machine guns are carried and rested on the ground for firing, or they are mounted on vehicles designed to carry them.

The main machine guns in use are the 7.62mm M-60 machine gun (being replaced by the 7.62mm M-240 machine gun) and the .50 caliber heavy machine gun, the M2.

M-60

The M-60E3 7.62mm machine gun is an air-cooled, portable, or tripod-mounted machine gun designed for ground operations. It has a fixed head space and timing that permits rapid changing of barrels. Slightly different from its parent, the M-60, the M-60E3 has a receiver-attached bipod that easily deploys for stability. It has an ambidextrous safety, universal sling attachments, a carrying handle on the barrel, and a simplified gas system that does not require safety wire to prevent loosening. However, the lightweight barrel is not safe for

overhead fire and is not capable of sustaining a rapid rate of fire of 200 rounds per minute without severe damage failure of the barrel.

M-2

The M-2 .50 caliber machine gun provides sustained, concentrated fire in combat. The M-2 can be operated in a semi-automatic or automatic mode. An anti-personnel and anti-aircraft weapon, it can be fired from a fixed position or from most vehicles.

A third type of machine gun is the 40mm Mark-19 automatic grenade launcher (AGL). It is a machine gun hybrid of the M-203 grenade launcher.

Mk-19 Grenade Launcher

The MK-19 Grenade Launcher is a fully automatic weapon that fires 40mm grenades. The MK19-3 can be mounted on a tripod or a vehicle swivel point. The weapon delivers accurate, intense, decisive firepower against personnel and lightly armored vehicles by shooting a variety of 40mm grenades. Because of its weight, it is crew transportable only over short distances with limited amounts of ammunition. The MK19-3 shoots a 40mm grenade, which can kill in a 32-foot (5-meter) circle and wound in a 100-foot (30-meter) circle (48 feet). The grenade can penetrate two inches of armor.

Armored Combat Vehicles

Armored combat vehicles are the second set of crew-served weapons systems. This category has a series of different tracked vehicles with two purposes.

The current M1-series "Abrams" is the front-line Army tank. Tanks are designed to be the spearhead of any thrust against a well-armed enemy. They carry a main gun (120mm) designed to destroy other tanks and are mounted on a heavily armored track system for all-terrain mobility. Tanks will often mount two or more machine guns to increase their firepower. The tank has a crew of four (a tank commander (E-6), a gunner, a loader, and a driver.

M1A1

The M-1 main battle tank is called the Abrams, after Gen. Creighton Abrams, former Army Chief of Staff. It is a fully tracked, low profile tank with shoot-on-the-move capability and a high degree of maneuverability. Special armor, fuel, and ammunition compartmentalization and an automatic fire detection and suppression system provide the crew with a high level of protection. The principal version, the M1A1, features a 120mm cannon with a thermal sight, allowing it to track on a target by the heat it produces, and a fire control stabilization system that tracks such variables as tank speed, target speed, wind speed, tilt and ammunition temperature. The Abrams operates in all climate and lighting conditions. Going from the M1A1 to M1A2, the Army did several things that significantly reduced ballistic vulnerability, adding dual, redundant harnesses components, redundant data buses, distributing electrical power systems so all the power controls are not in one place. These improvements include the 2nd Generation FLIR; Embedded Battle Command (EBC) command and control software; a Management System (TMS); and an Under Armor Auxiliary Power Unit (UAAPU).

Armored fighting vehicles also include the M2/3 Bradley Infantry Fighting Vehicles (BFV) or M113-series Armored Personnel Carriers. Both types of

vehicles are designed to carry soldiers (mechanized infantrymen) in the back of the vehicle.

M2/M3 Bradley

The Bradley Fighting Vehicle (BFV) is a lightly armored, fully tracked fighting vehicle that provides cross-country mobility, mounted firepower, and protection from artillery and small arms fire. The BFV has a crew of three (a track commander, a gunner for the TOW anti-tank missile system and a .25 mm chain machine gun, and a driver. The BFV can also carry up to six infantrymen.

It is used in mechanized infantry and armored cavalry combat. Infantry can fight from inside the vehicle by using modified M-16 rifles mounted in firing ports or may dismount from the M-2 version to fight on foot. Armored cavalry units also use the M-3 version. The vehicle is armed with a 25mm cannon, effective against most armored targets, and with the TOW missile, effective against lightly armored targets out to its maximum range of 3,750 meters (2.3 miles). BFVs, however, can not shoot at the enemy with a turret weapon and fire anti-tank missiles.

M113

The M113 series of personnel carriers is a lightly armored, full-tracked combat vehicle that provides protected transportation for troops or cargo in combat. The A2 model features improvements in the cooling, suspension, and personnel heating systems. The vehicle can carry up to 12 combat-equipped troops or a payload of two tons.

Armored Personnel Carrier (APC)s carry machine guns, but lack a turret. APCs are an armored "battlefield taxi" designed to rapidly move soldiers on the battlefield.

The M113 APC has been replaced in most Mechanized Infantry units by the BFV. However, the APC is still used to transport Engineer squads in Combat Engineer Battalions in the Armored and Mechanized Infantry Divisions.

Stryker

The Stryker Light Armored Vehicle (LAV) III is at the center of each Styker Brigade Combat Team (SBCT). SBCTs will be lighter and more mobile, yet offer firepower no enemy can hope to match. Each brigade will have more than 300 Strykers apiece.

All of the LAVs will be deployable by C-130 and larger aircraft. They will have a maximum speed of 60 miles per hour and a range of 300 miles on a tank of fuel. The LAV's armor protection will stop 50-caliber bullets and protect against 152 mm airburst shells. The LAV's tires can be inflated or deflated from inside the vehicle to adapt to surfaces ranging from deep mud to hardtop, and it has run-flat tires, a built-in fire-suppression system and self-recovery winch. The vehicles also run quieter than the current armored personnel carriers, increasing their "stealth," and they will reduce logistics costs, making the SBCTs an affordable alternative to today's heavy brigades.

The Stryker vehicle is being produced in two major variants: the Infantry Carrier Vehicle (ICV) and the Mobile Gun System. The Mobile Gun System (MGS) will have a 105mm cannon, the same gun tube as the one on the original M-1 Abrams tank. This is not a tank replacement, but it gives a direct fire capability to support the infantry elements. In all the Stryker will have eight configurations besides the MGS and ICV models — mortar carrier, reconnaissance vehicle, anti-tank guided missile vehicle, fire-support vehicle, engineer support vehicle, command-and-control vehicle, medical-evacuation vehicle and the NBC reconnaissance vehicle. The LAVs are not a replacement for the M1 Abrams tank or the M3 Bradley Infantry Fighting Vehicle.

Indirect Fire Weapons

Indirect fire weapons systems are broken-down into three families: mortars, cannons/howitzers, or rockets. Cannon artillery weapons fire at the enemy in an indirect-fire role from distances up to 30 km. (i.e., an observer sees the enemy and tells the gunner where to shoot and the shell takes an arched trajectory.)

Cannon artillery systems are either carried or towed by truck or can move under their own power ("self-propelled").

M-198 (155 mm)

The M-198 is a helicopter transportable 155mm towed howitzer used in a general support role for Army light infantry divisions or Marine Corps Air Ground task forces. The M-198 has a conventional split trail carriage and utilizes a hydropneumatic recoil mechanism. In firing position, the split trails are spread and locked, the wheels are raised off the ground, and the weapon rests on a firing base.

M119 (105 mm)

The M-119A1 is a lightweight 105mm artillery piece that can be positioned quickly by ground vehicle or helicopter. The M-119A1, usually towed by a HMMVW battle vehicle, is air mobile (can be sling loaded) by helicopter, and air transportable by C-130 and larger transport aircraft. It fires all U.S. and NATO standard 105mm projectiles.

M-102 (105 mm) Towed Howitzer

The M-102 105mm howitzer is used in air mobile (helicopter) and light infantry operations. The weapon carriage is lightweight welded aluminum, mounted on a variable recoil mechanism. The weapon is manually loaded and positioned, and can be towed by a 2 ton truck or High Mobility Multipurpose Wheeled Vehicle (HMMWV), can be transported by UH-60 Black Hawk helicopters, or can be dropped by parachute with airborne units. The howitzer's high volume of fire compensates in large measure for the lower explosive weight of the projectile compared to the Army's 155mm howitzer.

M-109 (155 mm)

The M-109A3 is an armored self-propelled medium howitzer firing a 155mm (about 6.2 inch diameter) shell. It is used to provide indirect fire support. C-5 aircraft can transport the 155mm M-109A3. It has an amphibious capability when equipped with a flotation kit. Components of the weapon include a periscope, cannon, firing mechanism, howitzer cannon, elbow telescope, and panoramic telescope.

Paladin

The M109A6 Paladin is the latest advancement in 155mm self-propelled artillery. The system enhances previous versions of the M109 by implementing onboard navigational and automatic fire control systems. Paladin has both a Kevlar-lined chassis and a pressurized crew compartment to guard against ballistic, nuclear, biological, and chemical threats. The M109A6 is the most technologically advanced cannon in the Army inventory. This weapon has a 4 man crew, and weights approximately 62,000 lbs/32 tons, and has a cruising range of 186 miles, Max speed is 35 MPH, It has a fuel capacity of 133 gals. The Paladin can operate independently, from on the move, it can receive a fire mission, compute firing data, select and take up its firing position, automatically unlock and point its cannon, fire and move out - all with no external technical assistance. Paladin is capable of firing up to four rounds per minute to ranges of 30 kilometers. The Paladin features increased survivability characteristics such as day/night operability, NBC protection with climate control and secure voice and digital communications. The crew remains in the vehicle throughout the mission.

Bradley Fire Integration Support Team (BFIST)

The BFIST will replace most M981s (FISTVs) in the active force at the Company FIST OPFAC. There are two models of the system: the M7 and the M7A1. Both versions will have equivalent mobility, survivability, signature, night vision capability, and consume common repair parts as the maneuver force they support

Mortars are tubes that launch a small "bomb" at a high angle for a very short range.

M-224 (60 mm) Mortar

The M-224 60mm Lightweight Mortar is a smooth bore, muzzle-loading weapon. It is fired by dropping a projectile into the firing tube and the projectile strikes a fixed-firing pin at the bottom of the tube. The high explosive round used in the M-224 has snap-off propellant segments, allowing the gunner to adjust the range by changing the amount of propellant, and a variable fuse, adjusted by rotating the fuse head. The fuse setting allows the projectile to burst before impact, on impact or after impact.

M-29 (81 mm) Mortar

The M-29 81mm mortar is a smooth-bore, muzzle-loaded, high-angle, indirect fire weapon. It consists of a barrel, sight, bipod, and base plate (its circular base plate allows for firing in any direction).

M-252 (81 mm) Mortar

The M-252 81mm Medium Extended Range Mortar is a medium weight mortar that is highly accurate and has a greater range (4,500 meters to 5,650 meters) and lethality than the previous 81mm mortar. The muzzle end has a short tapered lead-in that acts as a blast-reducing device. The breech end is finned for better cooling. This mortar uses the standard M-64 mortar sight of the 60mm mortar, M-224.

M-30 (4.2 inch) Mortar

The 4.2 inch M-30 mortar, is a rifled muzzle-loading weapon designed for high-angle fire.

M120/M121 Mortar

A conventional smoothbore, muzzle-loaded mortar system that provides increased range, lethality and safety compared to the World War II-vintage 4.2-inch (107mm) heavy mortar system it replaced in mechanized infantry, motorized, armored, and cavalry units. It is employed in towed (M120) and carrier-mounted (M121) versions and in the Stryker Brigade Combat Team mortar carrier. It fires a family of enhanced, U.S.-produced ammunition.

Rockets can shoot farther and use larger warheads than cannons. Rockets can fire in excess of 50 km.

Multiple Launch Rocket System (MLRS)

The Multiple Launch Rocket System (MLRS) is a free-flight artillery rocket system that delivers large volumes of firepower in a short time. The system is used to attack enemy artillery, materiel, and personnel targets and suppress enemy air defenses. It consists of a launcher, two disposable pods, each containing six rockets or one missile, a fire control system, and an aiming device. The carrier is a derivative of the Bradley Fighting Vehicle.

Tactical Missile System (TACMS)

The Army TACMS missile system consists of a surface-to-surface guided missile with an anti-personnel/anti-materiel warhead. TACMS missiles are fired from a modified Multiple Launch Rocket System (MLRS) launcher.

Air Defense Weapons

Air Defense weapon systems, like their indirect fire counterparts, can be considered to be manpack/carried or self-propelled. The main classification, however, is determined by range.

A SHORAD (Short Range Air Defense) system is designed to provide air defense coverage in a small-but-critical area. The main weapon is the STINGER missile. It is fired from a shoulder-held launcher or a vehicle-mounted system called the AVENGER. STINGER crews in Armored and Mechanized Infantry units are equipped with an M2 Bradley, resulting in a Bradley Stinger Fighting Vehicle (BSFV).

Stinger

The Stinger is a shoulder-fired, "fire and forget" surface-to-air guided missile that enables the soldier or Marine to find, track and intercept low-altitude jets, propeller-driven fixed-wing aircraft, or helicopters. This passive infrared missile system homes in on the heat emitted by those aircraft. Stinger features an ability to find and track its target rapidly, and to destroy aircraft attacking from any direction. A dual detector seeker allows the missile to override certain infrared countermeasures to evade detection. The missile is packaged within its disposable launch tube. It is delivered from the manufacturer ready to operate and requires no field testing or direct support maintenance.

Avenger

The Avenger is an air defense missile system consisting of a pedestal mounted "Stinger" missile battery that operates from a High Mobility Multi-purpose Wheeled Vehicle (HMMWV) chassis. The system consists of eight heat-seeking Stinger missiles in two quickly reloadable pods and a .50-caliber machine gun for self-defense. Avenger provides protection to rear echelon units and command posts against low-altitude and high-speed airplanes and helicopters.

HIMAD (High-to-Medium Air Defense) is the second classification. Another Gulf War familiar system (the PATRIOT) is the mainstay weapon in this category. A PATRIOT system has a series of tracking radar, command shelters, and missile launchers and can shoot-down enemy aircraft or missiles from great distances. Due to their large size and bulk, there are no manpack HIMAD systems.

Linebacker

The Linebacker is the STINGER that is mounted on a Bradley system.

Patriot

The Patriot is an air defense guided missile system designed to cope with an air threat, which includes saturation, maneuver, and electronic countermeasures, by both aircraft and tactical ballistic missiles. The system uses single multi-function phased array radar, Command and Track-Via-Missile guidance, and automated operations with capability for human override. A Patriot battery includes the engagement control station, radar, electric power plant, eight launchers, and 64 missiles.

Rotary Wing Aircraft

Rotary wing aircraft (helicopters) have three families:

- Attack Helicopters
- Observation and Reconnaissance
- Utility and Cargo

Attack helicopters, such as the AH-64 Apache and AH-1 Cobra, carry weapons such as grenade launchers, automatic cannons, rockets, and anti-tank missiles. They escort troop-carrying helicopters into battle, or directly attack the enemy.

AH-1 Cobra

The Cobra is a two-bladed, tandem-seat (front & back), attack helicopter powered by a single turbine engine. This weapon system performs anti-armor,

air cavalry and armed reconnaissance roles and can attack point (individual) targets with its anti-armor and anti-helicopter capabilities. It also provides fire support and security missions. The mix of weaponry depends on the model. Cobras can be armed with TOW and Hellfire anti-armor missiles, Sidewinder anti-aircraft missiles, Sidearm anti-radar missiles, Hydra 70 rockets, 20mm (.80 caliber) cannon and a 7.62mm (.30 caliber) machine gun.

AH-64 Apache

The Apache is a state-of-the-art attack helicopter capable of defeating a wide range of targets, including all armored vehicles. This helicopter, which is capable of performing its mission at night and under adverse weather conditions, provides direct aerial fire as an integral element of ground units. Armed with laser-designated Hellfire missiles, 30mm cannon and Hydra 70 rockets, the Apache can direct highly mobile and effective firepower against the enemy. Its Target Acquisition Designation Sight (TADS) and Pilot Night Vision Sensor (PNVS) provide day and night laser designation of targets and infrared night vision for both the pilot and the copilot/gunner.

Observation and reconnaissance helicopters are designed to find enemy forces, track them, and direct artillery fire on them or guide attacks to the enemy location. These helicopters are armed and can engage enemy attack helicopters or jets in combat situations. They also carry two Hellfire anti-tank missiles that can be used to defeat enemy armor.

RAH-66 Comanche

The Boeing-Sikorsky RAH-66 Comanche is the Army's next generation armed reconnaissance helicopter. It also is the first helicopter developed specifically for this role. The RAH-66 Comanche is an advanced twin engine, two seat (tandem) light attack/armed reconnaissance helicopter currently being developed for the U. S. Army The Comanche features a five-bladed main rotor, a shrouded tail rotor, a low radar cross section composite fuselage with retractable weapons pylon, a fly-by-wire flight control system, and a fully integrated cockpit. The mission equipment package incorporates forward-looking infrared (FLIR) and image intensified television sensors for night pilotage and target acquisition. The Comanche will initially be armed with the semi-active laser Hellfire missile, the air-to-air Stinger missile, 2.75-inch aerial rockets, and a turreted 20 mm gun. The Comanche is intended to replace the current fleet of AH-1 and OH-58 helicopters in all air cavalry troops and light division attack helicopter battalions, and supplement the AH-64 Apache in heavy division/corps attack helicopter battalions. The new reconnaissance and attack helicopter scheduled to begin joining the Army in 2008.

OH-58D Kiowa Warrior

The Kiowa is a two-seat, single engine, four-bladed main rotor, scout helicopter with a low-light television, a thermal imaging system, and a laser range finder/designator incorporated into a mast-mounted sight. The helicopter, when armed, is used in aerial reconnaissance, aerial security, target acquisition, command and control, defensive air combat and multipurpose light helicopter contingency operations.

Utility and Cargo helicopters are like flying trucks designed to rapidly transport ("lift") troops, equipment, and supplies. They can be modified for special missions.

UH-1 Huey

The UH-1 (Huey) is the oldest member of the helicopter fleet (the first one was delivered in 1958) in the Department of Defense inventory. The Huey transports troops and equipment into combat and flies combat resupply, aeromedical evacuation, and command and control missions. It has a crew of three; two pilots and a crew chief, and can transport a 3,000-pound (1,350 kg) payload, eight combat troops, or a 4,000-pound (1,800 kg) sling load. In the Marine Corps, the Huey provides utility combat helicopter support to the landing force commander during ship-to-shore movement.

UH-60 Blackhawk

The Army's UH-60L Black Hawk (and the versions of the other services) is a twin-engine, medium lift helicopter. It is used for troop transport, cargo lift, anti-submarine warfare, search and rescue, drug interdiction, anti-ship warfare and special operations. Each variation is equipped for the specific needs of its service. For example, the Navy's SH-60B Seahawk is an airborne platform for a weapon system that deploys sonar buoys (sonic detectors) and torpedoes in an antisubmarine role. Some versions, such as the Air Force's MH-60G Pave Hawk and the Coast Guard's HH-60J Jayhawk, are equipped with a rescue hoist with a 250 foot (75 meter) cable that has a 600 pound (270 kg) lift capability, and a retractable in-flight refueling probe. The Army's UH-60L Black Hawk can carry 11 soldiers or 2,600 pounds (1,170 kg) of cargo or sling load 9,000 pounds (4,050 kg) of cargo.

CH-47 Chinook

The CH-47 Chinook is a twin-engine, tandem rotor, cargo helicopter. This helicopter's primary missions are movement of ammunition, repair parts, petroleum and tactical movement of artillery, troops, and special weapons on the battlefield.

Engineer Vehicles

Maneuver units may have engineer support vehicles to support mobility and survivability, such as those pictured.

M-9 ACE

The M-9 Armored Combat Earthmover is an amphibious, fully tracked vehicle used to prepare firing positions for artillery, tanks and other weapon systems. It is equipped with an aluminum structure, which protects against small arms fire and artillery fragments. It has two smoke grenade launchers for its own protection and provides chemical-biological protection for the operator. It features an 8.7 cubic yard scraper bowl and bulldozer blade. The hydro-pneumatic suspension allows the front of the vehicle to be raised, lowered, or tilted to permit dozing, excavating, rough grading, and ditching. It has a two-speed winch with a 25,000-pound pull.

Wolverine - armored vehicle launch bridge (AVLB)

Grizley – breaching vehicle

The Float Bridge

M-728 Combat Engineer Vehicle (CEV) with short-barreled 165mm demolition projector

Chemical Vehicles

M-56/M-58 smoke generating equipment mounted on a HUMMV or M113A3.

Support Vehicles

All units will have support vehicles designed to help move bulk food, fuel, ammunition, special equipment, or entire troop units. Tracked support vehicles will normally be found in mechanized units, while wheeled vehicles will be found in all units.

Heavy Expanded Mobility Tactical Truck (HEMTT)

M-977 Cargo
M-978 Fueler

M983 Tractor
M984 Wrecker

The Heavy Expanded Mobility Tactical Truck (HEMTT) provides transport capabilities for re-supply of combat vehicles and weapons systems. There are five basic configurations of the HEMTT series trucks: M977 cargo truck with Material Handling Crane (MHC), M978 2500 gallon fuel tanker, M984 wrecker, M983 tractor and M985 cargo truck with MHC. A self-recovery winch is also available on certain models. This vehicle family is rapidly deployable and is designed to operate in any climatic condition where military operations are expected to occur.

Heavy Equipment Transport System (HETS)

The Heavy Equipment Transport System (HETS) consists of the M1070 Truck Tractor and the M1000 Heavy Equipment Transporter Semi-trailer. The HETS transports payloads up to 70 tons – primarily Abrams tanks. It operates on

highways worldwide (with permits), secondary roads, and cross-country. The HETS has a number of features that significantly improve the mobility and overall performance of the system in a tactical environment.

Family of Medium Tactical Vehicles (FMTV)

The MTV consists of two weight classes of vehicles and trailers, Light Medium Tactical Vehicles (LMTV) 2.5 Ton, Medium Tactical Vehicles (MTV) 5 Ton, Light Medium Tactical Vehicle Trailers (LMTVT) and Medium Tactical Vehicle Trailer (MTVT). There are 4 model configurations of the LMTV and 11 model configurations of the MTV. Several models in both weight classes are designed for Low Velocity Air Droppable (LVAD) operations and rapid deployment into remote areas.

M-939A2 5-Ton Truck

The M-939A2 tactical truck is a five-ton capacity, six-wheel drive cargo truck used for transportation of all types of supplies. The M-939 series comes in six body styles: cargo, dump, wrecker, van, and long wheel base cargo. Its central tire inflation system enables the crew to increase or decrease the air pressure in the tires to improve mobility on or off roads. It can tow 21,000 pounds.

Additionally, many vehicle types are modified to fill many different roles. The HMMWV and M113 both of which have command, medical, and armed variants.

High Mobility Multi-Purpose Wheeled Vehicle (HMMWV)

In the 1980s, the HMMWV replaced the famed Jeep as the Army's basic utility vehicle. Generally, it is the workhorse of the wheeled vehicle fleet. It is used as a weapons carrier to tow light howitzers or carry mortars. Variants of the "Humvee" are also used as ambulances, military police tactical vehicles, and for battlefield reconnaissance. The HMMWV has a cargo capacity of 1 to 2 tons, depending on the configuration. It is a highly mobile tactical vehicle with a common chassis for various configurations, including: Cargo/troop carrier, armament carrier, TOW missile carrier, ambulance, and shelter carrier.

Support vehicles fill many roles. Often a tracked vehicle will have a wheeled counterpart. Tracked command posts (M577) carry radios and maps like wheeled HMMWVs. Earth-moving equipment is tracked (M9 Armored Combat Earthmover--ACE) or wheeled (like a road grader).

M577A3 Command Post Carrier

The M577A3 Tracked Command Post Carriers are full-tracked lightweight vehicles used as an operational staff office and command post. The vehicle is C130 air transportable, however it is not air droppable. Additional materiel changes, outside of the A3 RISE Block Modifications, could also be applied to the M577. PM-M113's intention is to block the materiel changes as funding becomes available.

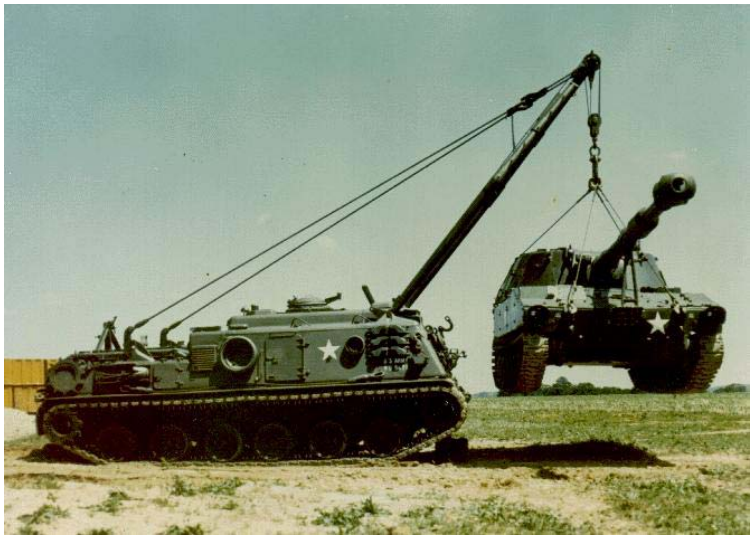
M973A2 Small Unit Support Vehicle (SUSV)

The Small Unit Support Vehicle (SUSV) is a full tracked, articulated vehicle designed to support infantry platoons and similar sized units during the conduct

of operations in arctic and alpine conditions. The SUSV can be used in all types of terrain, such as trackless terrain, rock, boulders, bog, marsh, and water and from arctic cold to tropical heat. The SUSV is a military vehicle designed for use as an all-terrain, amphibious, multi-role transport vehicle.

The system was produced in four variants; Cargo Carrier; Command, Control, and Communications; Ambulance; and Flatbed versions. The SUSV is designated in the following variants: M973, M973A1 (Cargo), M1065 (Command Control), M1066 (Ambulance), M1067 (Flatbed).

Recovery and repair tow trucks have a tracked cousin, the M88 Armored Recovery Vehicle, in tank units. Ambulances are also dual-natured, with a HMMWV or M113 both hauling and treating combat patients.



M-88 HERCULES

The M88A2 HERCULES [Heavy Equipment Recovery Combat Utility Lift and Evacuation System], formerly the M88A1E1 Improved Recovery Vehicle, addresses a long-standing US Army need to upgrade its recovery vehicles to safely tow and recover battle-damaged, mired or inoperative Abrams tanks. The HERCULES, using M88A1 hulls, modified to specification by Anniston Army Depot, upgrades the basic M88 chassis to meet the increased demands of towing, winching, and lifting the M1, M1A1, and M1A2 tank.

Among the most significant upgrades is the on-board recovery system. The winch and hoist capacities are greatly increased enabling the vehicle to lift 40% heavier loads and winch 55% higher capacities. HERCULES features a longer 35-ton hoist capability boom, a 140,000 pound (63,504 kg) constant pull main winch with 280 feet (85.3 m) of cable and an auxiliary 3-ton winch to aid main winch cable deployment. The Hercules also incorporates improved hydraulics, enhanced propulsion system, and heavier suspension, along with overlay armor protection and ballistic skirts. The vehicle's enhanced survivability with added

armor, which brings its weight to more of a match for the Abrams tanks it predominantly supports. The HERCULES upgraded power train allows it to tow a 25% larger load with better braking capacity and higher speeds, which better enables it to accompany maneuver forces. The crew includes three soldiers, rather than four.

Palletized Load System (PLS)

The Palletized Load System (PLS) consists of a prime mover truck with an integral self-loading and unloading capability, a payload trailer (M1076), and demountable cargo beds, referred to as flatracks. The PLS prime mover truck carries its payloads on its demountable flatrack cargo beds, or inside 8 x 8 x 20 ft International Standards Organization (ISO) containers, or shelters. The PLS prime mover truck comes in two mission-oriented configurations: the M1074 and the M1075. The M1074 is equipped with a variable reach Material Handling Crane (MHC) to support forward-deployed Artillery units. The M1075, without MHC, is used in conjunction with the M1076 trailer in support of transportation line haul missions. The M1076 trailer, capable of carrying payloads up to 16.5 tons, is equipped with a flatrack that is interchangeable between truck and trailer. The prime mover truck and trailer form a self-contained system that loads and unloads its cargo without the need for forklifts or other material handling equipment. Without leaving the cab, the driver can load or unload the truck in less than one minute, and both truck and trailer in less than five minutes.

ATTV

The Armored Treatment and Transport Vehicle (ATTV), which is built on a Bradley fighting vehicle chassis, improves mobility, survivability and medical treatment capability and is available in evacuation and treatment configurations. The ATTV offers clear advantages over the older M577 vehicle. After a wounded soldier is triaged and gets basic battlefield care, he can be loaded through an

ATTV's back door. En route to the battalion aid station, treatment can be conducted in a climate-controlled environment that provides protection from bullets and biochemical agents. At the aid station, another ATTV can receive patients and provide advanced life support.

Support Equipment

In addition to support vehicles, units will have a multitude of support equipment.

Radios, trailers (for cargo and water), bridge-building sets, tool kits, repair equipment, computers, forklifts, barges, and life-saving medical equipment are only a start to the massive list.

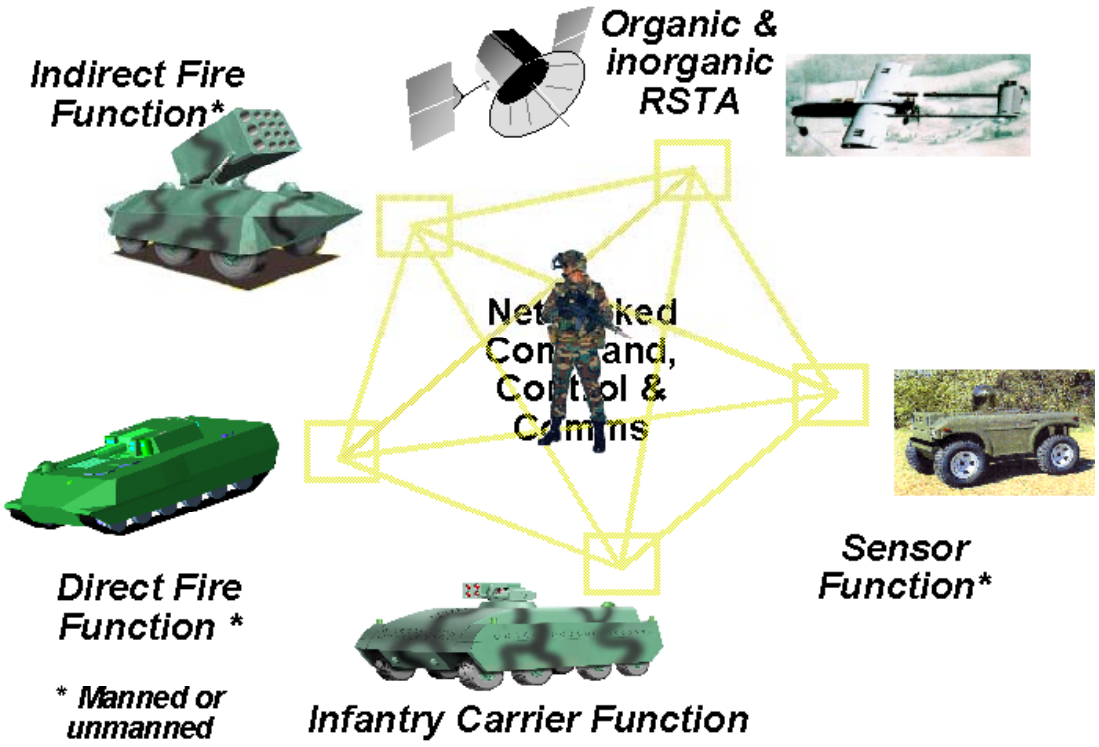
In short, the Army is designed to

- Deploy to and operate from a place that has no established infrastructure (roads, rails, ports, telephones, etc.)
- Conduct combat operations while sustaining itself indefinitely.

Future Combat Systems

Army Transformation is the process of making the US Army more responsive, deployable, agile, versatile, lethal, survivable, and sustainable.

During this period, the Army will invest in Science and Technology to acquire the Future Combat Systems (FCS), the centerpiece of the Future Force capability. The Future Force will come out of the development and refinement of weapons, equipment, communications, and training that will occur over the next 30-years when the entire Army would be transformed.



The FCS program will develop network centric concepts for a multi-mission combat system through an ensemble of manned and unmanned ground and air platforms. This system of systems design will be capable of adjusting to a changing set of missions, ranging from warfighting to peacekeeping, as the deployment unfolds. An FCS-equipped force will be capable of providing mobile-networked command, control, communication and computer (C4) functionalities; autonomous robotic systems; precision direct and indirect fires; airborne and ground organic sensor platforms; and adverse-weather reconnaissance, surveillance, targeting and acquisition.

Quiz

1. Of all the pieces of equipment that a soldier may be issued for field duty, which of the items listed below are common pieces every soldier will carry?
    a. Helmet, rucksack, and protective mask
    b. "Flak" vest, canteen, and ammunition pouch
    c. Both A and B
2. Which are specialized devices any soldier may be responsible for maintaining?
    a. NOMEX equipment, radio equipment
    b. Night vision devices, personal weapon
    c. All of the above
3. Which firearm is the primary firearm issued to most soldiers in all types of units?
    a. M-16
    b. M-9
    c. M-203
4. Which of the following is not considered a crew member position for an M1A1 or M2/M3?.
    a. vehicle commander
    b. gunner
    c. mechanic
5. Which of the examples of crew-served weapon systems is incorrect?
    a. Machine guns (M-60, M2)
    b. Armored Combat Vehicles (M113, M1)
    c. Air Defense weapons (Cobra, Apache)
6. Which of the following support vehicles is a tracked vehicle?
    a. HMMWV
    b. M9 ACE
    c. HEMTT

Answers

1. C
2. C
3. A
4. C
5. C
6. B